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UNITED STATES DEPARTMENT OF COMMERCE

# ELIMINATION OF WASTE

## SIMPLIFIED PRACTICE



# PAVING BRICKS

WASHINGTON  
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1922

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training

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**UNITED STATES DEPARTMENT OF COMMERCE**

**SIMPLIFIED PRACTICE RECOMMENDATION**

**No. 1**

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**PAVING BRICKS**

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**ACCEPTED BY**

American Association of State Highway Officials.

American Ceramic Society.

American Institute of Architects.

American Institute of Mining and Metallurgical Engineers.

American Society of Civil Engineers.

American Society for Municipal Improvement.

American Society for Testing Materials.

Columbus Ohio Engineers Club.

Federated American Engineering Societies.

Indiana Engineering Society.

National Paving Brick Manufacturers Association.

Western Society of Engineers.

Department of Agriculture.

Department of Commerce.

Department of the Interior.

Navy Department.

War Department.

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**ISSUED BY THE BUREAU OF STANDARDS**

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**WASHINGTON  
GOVERNMENT PRINTING OFFICE**

1922



## PERSONNEL OF FIRST CONFERENCE ON PAVING BRICKS.

[Held at Department of Commerce, Nov. 15, 1921.]

BARR, C. C., Barr Clay Co.  
BATES, P. H., Bureau of Standards, Department of Commerce.  
BLAIR, W. P., Indiana Engineering Societies.  
BOWLES, G. O., Mack Manufacturing Co.  
BOWLES, Oliver, American Institute of Mining and Metallurgical Engineers.  
BROWN, F. C., Bureau of Standards, Department of Commerce.  
COMPTON, R. Keith, American Engineering Council.  
DAILEY, John A., Western Society of Engineers.  
DUNN, Frank, Dunn-Wire-Cut Lug Brick Co.  
DUTY, S. M., Model Paving Brick Co.  
EMLEY, Warren E., American Society for Testing Materials.  
FEIKER, F. M., Department of Commerce.  
FISK, Geo. F., American Society for Municipal Improvements.  
GIFFORD, Lieut. Richard L., Navy Department.  
GREEN, Maj. H. L., War Department.  
GREENOUGH, M. B., N. P. B. M. A., Cleveland, Ohio.  
HALL, J. W., Westport Paving Brick Co.  
HERRICK, L. C., American Association of State Highway Officials.  
HUTCHINS, R. T., Mack Manufacturing Co.  
KERN, Leroy E., American Institute of Architects.  
MEHREN, E. J., editor Engineering News-Record.  
McCULLOUGH, E. W., Chamber of Commerce of the United States.  
McCULLOUGH, Herbert M., consulting architect, Dunn-Wire-Cut Lug Brick Co.  
MC CREARY, Harry, road engineer, Florida.  
PURDY, Ross, American Ceramic Society.  
RENKERT, O. W., Metropolitan Paving Brick Co.  
SHAW, L. I., Department of the Interior.  
SHELLEY, Henry T., chief engineer, Eastern Clay Products Association.  
TAYLOR, James S., Bureau of Standards, Department of Commerce.  
TILSON, Geo. W., consulting engineer, Dunn-Wire-Cut Lug Brick Co.  
TINGLEY, Francis, American Electric Railway Engineering Association.  
TRAVILLA, James C., consulting engineer, Dunn-Wire-Cut Lug Brick Co.  
UHLER, W. D., American Society of Civil Engineers.  
WALLACE, L. W., Federated American Engineering Societies  
WATTS, R. C., Columbus (Ohio) Engineers' Club.

## PERSONNEL OF SECOND CONFERENCE, MARCH 27, 1922.

### MEMBERS OF STANDING COMMITTEE.

BATES,<sup>1</sup> P. H., Bureau of Standards, Department of Commerce, Washington, D. C.  
BLAIR, Will P., American Society for Testing Materials, Washington, D. C.  
COMPTON, Col. R. Keith, Federated American Engineering Societies, Baltimore, Md.  
FISK,<sup>2</sup> George F., American Society of Municipal Improvement, Buffalo, N. Y.

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<sup>1</sup> Absent, but represented by W. A. Hull, Bureau of Standards.

<sup>2</sup> Absent, but represented by Col. R. Keith Compton.

GREENOUGH, M. B., National Paving Brick Manufacturers Association, Cleveland, Ohio.

HERRICK, Leon C., American Association of Highway Officials, Columbus, Ohio.

MEHREN,<sup>3</sup> E. J., editor of Engineering News-Record, New York, N. Y.

PURDY,<sup>4</sup> Ross C., American Ceramic Society, Columbus, Ohio.

UHLER,<sup>4</sup> William D., Harrisburg, Pa., American Society of Civil Engineers.

WILSON,<sup>5</sup> P. St. J., Bureau of Public Roads, Department of Agriculture, Washington, D. C.

#### MEMBERS OF ADVISORY COMMITTEE, DIVISION OF SIMPLIFIED PRACTICE

DURGIN, William A., Department of Commerce.

McCULLOUGH, E. W., Chamber of Commerce of the United States.

SHAW,<sup>4</sup> A. W., formerly chairman Conservation Division, War Industries Board.

STEVENSON,<sup>6</sup> A. A., American Engineering Standards Committee.

#### OTHER THAN COMMITTEE MEMBERS.

HOLDEN, Paul A., Chamber of Commerce of the United States.

HUDSON, R. M., Department of Commerce.

LOVE, H. J., National Slag Association.

MARKER, James P., Ohio Paving Brick Manufacturers Association.

TILSON, Geo. W., consulting engineer, Dunn-Wire-Cut Lug Brick Co.

TRAVILLA, James, consulting engineer, Dunn-Wire-Cut Lug Brick Co.

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<sup>3</sup> Appointed chairman of committee at this conference.

<sup>4</sup> Absent; no alternate present.

<sup>5</sup> Absent, but represented by Vernon M. Pierce, Bureau of Public Roads.

<sup>6</sup> Absent, but represented by A. S. McAllister, American Engineering Standards Committee.



# SIMPLIFIED PRACTICE RECOMMENDATION No. 1.

## PAVING BRICKS.

In accordance with the unanimous action of the joint conference of representatives of manufacturers, distributors, and users named on the opposite page and further amended by the standing committee at its meeting March 27, 1922, the United States Department of Commerce, through the Bureau of Standards, recommends that recognized sizes and varieties of paving brick be reduced to the following list:

### SIZES IN INCHES.

Width.	Depth.	Length.	Width.	Depth.	Length.
3	4	8½	3½	3½	8½
3½	4	8½	3½	3	8½

### VARIETIES.

[Sizes in inches.]

Plain wire-cut brick (vertical fiber lugless).			Wire-cut lug brick (Dunn).		
3	4	8½	3½	3	8½
3½	4	8½	3½	3½	8½
			3½	4	8½
Repressed lug brick.			Hillside lug brick (repressed).		
3½	4	8½	3½	4	8½

S. W. STRATTON,  
*Director, Bureau of Standards.*

APPROVED April 1, 1922, subject to regular annual revision by similar conference.

HERBERT HOOVER,  
*Secretary of Commerce.*



## THE FIRST CONFERENCE.

[November 15, 1921.]

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### OBJECT OF CONFERENCE.

The wide diversity in style, size, and variety; the necessity of reducing the process of manufacture to the lowest possible cost; the compulsion of eliminating every possible waste in the industry; and the determining of the areas of standardization possible in the particular industry, prompted the manufacturers of paving brick, through their National Paving Brick Manufacturers Association to call a conference under the auspices of the Department of Commerce for the standardization of vitrified paving brick.

### EXCERPTS FROM KEYNOTE ADDRESSES.

Mr. F. M. FEIKER, in opening the conference, stated that the conference is the first of a series to be held at the Department of Commerce to coordinate and forward the movement for elimination of waste in industry. He emphasized the fact that the Department of Commerce, under the leadership of Mr. Hoover, was not seeking to regulate business, that it did not advocate or believe in Government control, but is aiming to become a place where American business can express itself through the Government, and where the department, in turn, can perform useful services for business. In concluding his remarks, he impressed upon the conference the aid and moral influence the department offers to industry in effecting simplification of products, and reducing wasteful extremes of varieties.

MR. HOOVER. "I think the engineers have been united in the feeling that there is a great area of waste in American industry that can only find correction at the hand of the manufacturers, and then only through purely voluntary action on their part. There is one thing that stands out about American industry, that comes up daily to the department, and that is the remarkable efficiency of the individual industry, and the very considerable inefficiency of collective industry.



"There has been an attempt in a hundred different directions on the part of manufacturers to come to an agreement and conclusion for themselves that would meet these ends. There is, however, the difficulty when entering into such agreements, that they comprise some violation of the trade acts. This present administration felt it could perform a service to manufacturers if it acted as a center point around which their own cooperative action could take place. It is not the desire of this department to enter into any compulsory methods. I do not believe that the impulse and progress of American industry can come from Government legislation, or interference; but there are occasions, I think, when the friendly help of the Government can furnish a center point for the communication and discussion of manufacturing groups, and those professions and trades with which they must also come to some conclusion.

"There are a number of industries in which the manufacturers are carrying on their own surveys and are in consultation with the department, but to make any of this effective does not lie entirely with the manufacturers, who must have the cooperation of outside groups. This is the first time that we have attempted to bring the groups together; first, the manufacturer, then those who dominate his consumption; so I am in hopes we can get results. I know that all of you will enter into the conference with the desire to secure something effective from it."

#### SURVEY OF CONDITIONS IN FIELD.

A survey of the field as reported to the National Paving Brick Manufacturers Association by 44 companies representing 4,245,300 tons of annual capacity showed repressed lug brick as the predominant variety in 1914. This type constituted more than 72 per cent of all the product marketed. The use of the type declined steadily and uniformly in proportion to all types until 1920, when the percentage had fallen to slightly less than 25 per cent.

Second in importance was wire-cut lug brick manufactured under the Dunn patents. This type represented about 15 per cent of total shipments, increasing to approximately 33 per cent in 1919. During 1920, however, the percentage of such shipments dropped to 22 per cent.

Vertical fiber lug brick ranked third in shipments during 1914, equaling about 7 per cent. A slow upward tendency is noticeable



in this style of brick between 1915 and 1920, the shipments having reached 13.3 per cent in the latter year.

Plain wire-cut brick (vertical fiber lugless, fourth in total shipments in 1914 with a percentage of 6) remained substantially the same until 1917, with a slight rise and fall intervening. From 1917 to 1920 a material increase in the percentage of this type to all brick shipped caused it to be the predominating type, a gain of 34 per cent being made.

Special brick includes as the principal types, hillside brick made under the Dunn patent, repressed hillside brick, and street railway track brick. In no year from 1914 to 1920 do specials exceed 3 per cent of total shipments, and roughly hold their own at from 2 to 3 per cent each year.

The following table <sup>7</sup> shows the total number of paving brick (of 66 different sizes and 9 varieties) shipped during the years 1914 to 1920, inclusive:

1914.....	451, 116, 273
1915.....	441, 555, 483
1916.....	462, 442, 795
1917.....	428, 158, 211
1918.....	235, 857, 141
1919.....	325, 413, 109
1920.....	301, 436, 339

The results of the field survey indicated conclusively that 2 sizes of 10 varieties constituted the major shipments of paving brick during the years 1914 to 1920, and that these 2 sizes and 10 varieties have grown at the expense of the remaining 56 varieties manufactured. A conclusive proof that simplification in the paving brick field was not only desirable but essential.

#### BRIEF REPORT OF DISCUSSION.

The survey report, as prepared by the National Paving Brick Manufacturers Association, was submitted to the conference of 35 representatives of manufacturers and users of paving brick, and with practically no discussion 46 varieties were eliminated by unanimous ballots of the conference.

A considerable debate ensued concerning further eliminations. A motion was passed appointing a committee of 5 to consider eliminations in the remaining 20 varieties. This committee discussed the further elimination of sizes during the lunch adjournment period. In approaching the subject the committee con-

<sup>7</sup> Data obtained through questionnaires from 44 companies.



sidered it desirable, if possible, to so reduce the number of sizes that all brick could be cut out of two clay columns: One, 3 inches high; and the other, 4 inches high.

On consideration, the committee felt that the present demands are such that there must be placed at the disposal of engineers brick to make a wearing surface either 3,  $3\frac{1}{2}$ , or 4 inches in depth. In the smaller cities a 3-inch pavement is wanted. The larger cities require a 4-inch brick. The State highway departments, on the other hand, find 3-inch brick altogether too shallow for their traffic and 4-inch deeper than necessary, and therefore going to a  $3\frac{1}{2}$ -inch depth. With these 3 depths considered imperative, the committee found it desirable to eliminate only 9 of the varieties over and above those eliminated during the morning session.

The report of the committee was read and adopted without debate. In order to provide for usual variations incident to the manufacture of brick, a resolution was adopted allowing a tolerance of one-eighth inch in width and depth and of one-half inch in length.

A resolution was also adopted appointing a standing committee of 10 to effect a greater degree of cooperation between the Department of Commerce and the various organizations and manufacturers incident to the paving brick industry, and to consider further eliminations in the existing varieties of paving brick.

#### FINAL STATEMENT OF ACTION.

The combined efforts of the first conference resulted, in less than six hours, in an elimination of 55 varieties out of 66, with a great saving to manufacturer, producer, and user, and completed an important and decisive chapter in the growth and development of simplification as a fundamental principle of twentieth century manufacturing.



## SUMMARY OF SECOND CONFERENCE.

At the meeting of the standing committee on March 27, 1922, a survey of the shipments of paving brick was submitted by the National Paving Brick Manufacturers Association as a basis for further eliminations. This survey plainly indicated that fewer varieties would amply meet the requirements of the industry. A brief discussion followed.

In describing the method of encouraging, through the simplified practice recommendations, the nation-wide acceptance of the recognized sizes and types of paving brick, Mr. Durgin emphasized the importance of unanimous action in the recommendations of the conference regarding the proposed further eliminations.

The conference accepted this suggestion, and the four sizes under discussion were unanimously eliminated, thereby reducing the original 11 to the present 7 listed herein.

### Four Sizes of Brick Eliminated.

**Vertical fiber lug**

**Inches**

$3 \times 4 \times 8\frac{1}{2}$

$3\frac{1}{2} \times 4 \times 8\frac{1}{2}$

**Wire-cut lug hillside**

**Inches**

$3\frac{1}{2} \times 4 \times 8\frac{1}{2}$

**Repressed lug**

$3\frac{1}{2} \times 3\frac{1}{2} \times 8\frac{1}{2}$



